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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/502,194	02/10/2000	Santosh G. Abraham	Hp 10990708-1	4861

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EXAMINER

STEVENS, THOMAS H

ART UNIT	PAPER NUMBER
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2123

DATE MAILED: 04/05/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/502,194	ABRAHAM ET AL.	
	Examiner	Art Unit	
	Thomas H. Stevens	2123	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 February 2000 & 20 March 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-41 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-41 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 February 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>4 & 5</u> . | 6) <input type="checkbox"/> Other: |

DETAILED ACTION

1. Claims 1-41 are pending.
2. Claims 1-41 are rejected.

Information Disclosure Statement

3. The listing of references on pages 1-2 in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609 A(1) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the examiner on form PTO-892 has cited the references, they have not been considered.

Claim Interpretation

4. Office personnel are to give claims their "**broadest reasonable interpretation**" in light of the supporting disclosure. *In re Morris*, 127 F.3d 1048, 1054-55, 44 USPQ2d 1023, 1027-28 (Fed. Cir. 1997). Limitations appearing in the specification but not recited in the claim are not read into the claim. *In re Prater*, 415 F.2d 1393, 1404-05, 162 USPQ 541, 550-551 (CCPA 1969). See *also *In re Zletz*, 893 F.2d 319, 321-22, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989) ("During patent examination the pending claims must be interpreted as broadly as their terms reasonably allow") The reason is simply that during patent prosecution when claims can be amended, ambiguities should be recognized, scope and breadth of language explored, and clarification imposed

An essential purpose of patent examination is to fashion claims that are precise, clear, correct, and unambiguous. Only in this way can uncertainties of claim scope be removed, as much as possible, during the administrative process. **The examiner equates “validity filtering” and “selectable” processes to “Spacewalker” (column 6, lines 60-62; and column 8, lines 30-36); and equates “coupled terms” to parameters corresponding to multiple components as stated on page 8 of the specification.**

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

6. Claims 1-12, 14-41 are rejected under 35 U.S.C. 102(e) as being anticipated by Schlansker et al. (U.S. Patent 6,408,428 (1999)).

Schlansker et al. teaches a hierarchical approach of evaluating processors (cache) and provides a method to account for each stage of changes (abstract).

Claim 1: A method of programmatically selecting system designs (column 21, lines 9-11) from a system design space (abstract, line 1-5), the method comprising: specifying system designs as combinations of component designs from respective component design spaces; applying component quality filters to the component design spaces to produce component quality sets of designs; and forming a Cartesian product (column 43, lines 14-16) of the component quality sets to obtain a set of system designs.

Claim 2: The method of claim 1, further comprising applying component validity filters (column 13, lines 4-9, 16-19, and 50-55) to respective component design spaces before applying the component quality filters, wherein the component quality sets of designs include only designs satisfying respective component validity filters.

Claim 3: The method of claim 1, further comprising applying a system validity filter to the set of system designs to produce a validity filtered set of system designs (column 8, lines 30-36).

Claim 4: The method of claim 3, further comprising applying a system quality filter to the set of system designs (column 13 lines 4-19).

Claim 5: The method of claim 1, further comprising applying a system quality filter to the set of system designs (column 13 lines 4-19).

Claim 6: A method of programmatically selecting system designs that are specified by combinations of component designs (column 7, lines 5-30), the method comprising: preparing component validity sets for each of the component designs by applying component validity filters to corresponding component design spaces, the component validity filters defined by corresponding component validity predicates; and forming a set of system designs that is a Cartesian product of the component validity sets (column 43, lines 14-16).

Claim 7: The method of claim 6, wherein the component designs are specified by component parameters, and the component validity filter for each component is independent of the component parameters of other components (column 10, lines 50-63).

Claim 8: The method of claim 6, further comprising applying a system validity filter to the Cartesian product of the component validity sets (column 43, lines 14-16).

Claim 9: The method of claim 6, further comprising applying a system quality filter to the Cartesian product (column 43, lines 14-16) of the component validity sets.

Claim 10: The method of claim 6, further comprising applying a system evaluation function (column 4, lines 16-27) and a system quality filter to the Cartesian product (column 43, lines 14-16) of the component validity sets after applying a system validity filter.

Claim 11: The method of claim 10, further comprising applying a component evaluation (column 4, lines 16-27) function and a component quality filter to the component validity sets (column 14, lines 1-7).

Claim 12: The method of claim 6, further comprising applying a component evaluation function (column 4, lines 16-27) and a component quality filter (column 14, lines 1-7) to at least one of the component validity sets before forming the set of system designs (column 13, lines 57-66).

Claim 14: A method of selecting system designs that are specified by combinations of component designs (column 17, lines 28-35), the method comprising: preparing component validity sets for each of the component designs by applying component validity filters to corresponding component designs (column 13, 50-66) the component

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validity filters defined by corresponding component validity predicates (column 15, lines 28-40); preparing component quality sets by applying corresponding component evaluation functions and component quality filters to the component validity sets; and forming a set of system designs that is a Cartesian product (column 43, lines 14-16) of the component quality sets.

Claim 15: The method of claim 14, further comprising applying a system validity filter to the Cartesian product (column 43, lines 14-16) of the component quality sets.

Claim 16: The method of claim 14, further comprising applying a system evaluation function (column 4, lines 16-27) and a system quality filter to the Cartesian product (column 43, lines 14-16) of the component quality sets.

Claim 17: The method of claim 16, wherein the component evaluation functions and the system evaluation function produce component evaluation metrics (column 4, lines 16-27) and system evaluation metrics (columns 83 and 84 VLIW evaluation; column 84, lines 31-45), respectively, and the system evaluation metrics are obtained from the component evaluation metrics.

Claim 18: A computer readable medium comprising computer executable instructions for performing the method of claim 1 (column 16, line 41).

Claim 19: A computer readable medium comprising computer executable instructions for performing the method of claim 6 (column 16, line 41).

Claim 20: A computer readable medium comprising computer executable instructions (column 4, lines 45-48) for performing the method of claim 14.

Claim 21: A method of programmatically selecting a system design from a set of system designs, comprising (column 3, lines 17-24): defining a system validity predicate (column 15, 27-40) that is a function of two or more terms; defining partial validity predicates by expressing the system validity predicate in a canonical form; applying partial validity filters that are defined by the partial validity predicates (column 3, lines 57-60) to the system designs to obtain partial validity sets; and combining the designs from the partial validity sets to obtain sets of designs satisfying each of the two or more terms.

Claim 22: The method of claim 21, where each of the partial validity predicates is in product form (column 42, line 32).

Claim 23: The method of claim 21, wherein the partial (column 3, lines 57-61) validity predicates are mutually exclusive (column 10, lines 33-34).

Claim 24: A method of programmatically selecting a set of system designs (column 21, lines 9-11), comprising: selecting a system validity filter defined by a system validity predicate, the system validity predicate including one or more partial validity predicates (column 15, lines 28-40) that define partial validity filters; applying the partial validity filters to the system designs (column 3, lines 57-60); forming partial validity sets that include system designs satisfying respective partial validity filters; applying an evaluation function to the system designs of the partial validity sets (column 3, lines 57-60), the evaluation function producing an evaluation (column 4, lines 16-27) metric for each system design; applying a quality filter to the system designs of the partial validity sets, the quality filter comparing and selecting system designs based on the evaluation metrics and producing respective partial quality sets; and combining the partial quality sets to form a first quality set (column 13, lines 50-66).

Claim 25. The method of claim 24, further comprising applying the quality filter to the first quality set (column 14, lines 15-27).

Claim 26: The method of claim 24, wherein each of the partial validity (column 3, lines 41-46) predicates (column 15, lines 28-40) is in product form (column 43, lines 14-16).

Claim 27: The method of claim 26, wherein the system validity (column 3, lines 41-46) predicate (column 15, lines 28-40) is a product (column 43, lines 14-16) of the partial validity predicates.

Claim 28: The method of claim 26, wherein the partial validity (column 3, lines 41-46) sets are combined to form (column 4, lines 16-25) two or more system validity sets.

Claim 29: A computer readable medium (column 92, claim 17) having computer executable instructions for performing the method of claim 24.

Claim 30: A computer readable medium having software for performing the (column 16, line 41) method of claim 25.

Claim 31: A method of programmatically selecting a design for a cache memory, comprising: selecting components for the cache memory; determining component Pareto sets for the components; preparing a combined Pareto set from the component Pareto sets (column 14, lines 15-27); and selecting a cache memory design from the combined Pareto set.

Claim 32: A method of selecting a design for a processor system, the processor system including a processor and a cache memory (column 31, lines 65-66), the method comprising: preparing a component Pareto set for the processor; preparing a component Pareto set for a cache memory; preparing a combined Pareto set from the component Pareto sets of the processor and the cache memory; and selecting a processor system design from the combined Pareto set (column 85, lines 16-36).

Claim 33: A method of programmatically generating a set of designs for a processor system, comprising: dividing the processor system into at least a processor component and a memory component; preparing component validity sets for the processor component and the memory component (column 16, lines 39-52); forming a Cartesian product (column 43, lines 14-16) of the component validity sets to produce a processor system validity set.

Claim 34: The method of claim 33, further comprising expressing the system validity function in a logical canonical form (column 53, lines 26-30-20).

Claim 35: A method of designing a processor system that includes a processor component and a memory component (column 31, lines 65-66), comprising: determining component validity sets for the processor component and the memory component; dividing at least one of the component validity sets into subsets (column 6, lines 55); and generating sets of system designs by combining component designs from the component validity sets and the subsets.

Claim 36: A method of generating a set of partial validity (column 3, lines 57-61) predicates for a system design that includes component designs for at least a first component and a second component (column 21, lines 47-49), the method comprising: obtaining a system validity function defined by a system validity predicate (column 15,

lines 28-34); and identifying coupled terms in the system validity predicate, the coupled terms including parameters (column 7, line 22) of the components.

Claim 37: The method of claim 36, wherein the system design is a processor system design and the components include a processor component and a memory component (column 16, lines 39-52).

Claim 38: The method of claim 37, further comprising expanding the coupled terms to obtain singleton terms (column 54, lines 11-21) containing parameters of only the processor component and singleton terms containing parameters of only the memory component.

Claim 39: The method of claim 36, further comprising expanding the coupled terms to obtain singleton terms (column 54, lines 11-21) containing parameters of only a first (column 21, lines 47-49) component and singleton terms containing parameters of only a second component.

Claim 40: The method of claim 39, further comprising expressing the system validity predicate in canonical form (column 53, lines 26-30-20).

Claim 41: The method of claim 36, further comprising expressing the system validity predicate in canonical form (column 53, lines 26-30-20).

Claim Rejections - 35 USC § 103

7. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claim 13 is rejected under 35 U.S.C. 103 (a) as unpatentable by Schlansker et al (U.S. Patent 6,408,428 (1999)), in view of Jacome et al. ("Lower Bound on Latency for VLIW ASIP Datapaths". IEEE (1999)).

Schlansker et al. teaches a hierarchical approach of evaluating processors (cache) and provides a method to account for each stage of changes (abstract); but doesn't teach lower bound estimates.

Jacome et al. teaches traditional lower bound estimates on latency for dataflow graphs to account for data transfer delays (abstract).

At the time the invention was made, it would have been obvious to one of ordinary skill in the art to use Jacome et al. to modify Schlansker et al. since it would have been advantageous to capture the empirical results at all levels so as to modify applicable processing instructions.

Claim 13: The method of claim 12, further comprising: selecting a partial system design that includes component designs for at least one component (Schlansker: column 82, lines 23-31); obtaining a lower bound (Jacome: abstract; and pg. 262, sections 3 and 3.1) for an evaluation metric for a system design, wherein the system design includes the partial system design; and comparing an evaluation (Schlansker: column 4, lines 16-27) metric of a system that includes the partial system design to the lower bound.

Correspondence Information

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tom Stevens whose telephone number is (703) 305-0365, Monday-Friday (8:30 am- 5:30 pm) or contact Supervisor Mr. Kevin Teska at (703) 305-9704. The fax number for the group is 703-872-9306.


Any inquires of general nature or relating to the status of this application should be directed to the Group receptionist whose phone number is (703) 305-3900.

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THS


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